STIC Search Report
EIC 1700

USPTO

STIC Database Tracking Number: 145756

TO:	From:
Sanza McClendon Location: REM 10D70 Art Unit : 1711 March 3, 2005 Case Serial Number: 10712590	Usha Shrestha Location: EIC 1700 REMSEN 4B28 Phone: 571/272-3519 usha.shrestha@uspto.gov

Search Notes

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EIC17000

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact***:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art **found**, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art **not found**:*
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

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Mellerson, Kendra

From: Unknown@Unknown.com
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ResponseHeader=Commercial Database Search Request

AccessDB#= 145756

LogNumber= _____

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MyDate=Tue Feb 22 14:27:00 GMT-0500 (Eastern Standard Time) 2005

submitto=STIC-EIC1700@uspto.gov

Name=Sanza McClendon

Empno=75688

Phone=2-1074

Artunit=1711

Office=10D70 Rem

Serialnum=10/712,590

PatClass=522/187

Earliest=11/13/2003

Format1=paper

Searchtopic=please search for the process of claim 1

Comments=

send=SEND

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Bib Data Sheet

CONFIRMATION NO. 8997

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/712,590	11/13/2003 RULE	522	1711	59390US002

APPLICANTS

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** CONTINUING DATA **********

** FOREIGN APPLICATIONS **********

IF REQUIRED, FOREIGN FILING LICENSE GRANTED
** 02/10/2004

Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance Verified and Acknowledged Examiner's Signature Initials	STATE OR COUNTRY MN	SHEETS DRAWING 2	TOTAL CLAIMS 58	INDEPENDENT CLAIMS 1

ADDRESS
32692
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PO BOX 33427
ST. PAUL , MN
55133-3427

TITLE
Bromine, chlorine or iodine functional polymer electrolytes crosslinked by e-beam

FILING FEE	FEES: Authority has been given in Paper	☐ All Fees ☐ 1.16 Fees (Filing)

RECEIVED 1584	No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	❑ 1.17 Fees (Processing Ext. of time) ❑ 1.18 Fees (Issue) ❑ Other _____ ❑ Credit

Bromine, Chlorine or Iodine Functional Polymer Electrolytes Crosslinked by E-Beam

Abstract

A method is provided for making a crosslinked polymer electrolyte, typically in the form of a membrane for use as a polymer electrolyte membrane in an electrolytic cell such as a fuel cell, as well as the polymer so made, the method comprising application of electron beam radiation to a highly fluorinated fluoropolymer comprising: a backbone derived in part from tetrafluoro-ethylene monomer, first pendent groups which include a group according to the formula $-SO_2X$, where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation, and second pendent groups which include Br, Cl or I. Typically, the membrane has a thickness of 90 microns or less, more typically 60 or less, and most typically 30 microns or less.

We claim:

1. A method of making a crosslinked polymer comprising the steps of:

a) providing a highly fluorinated fluoropolymer comprising: a backbone derived in part from tetrafluoroethylene monomer, first pendent groups which include a group according to the formula $-SO_2X$, where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation, and second pendent groups which include a halogen atom selected from the group consisting of Br, Cl and I; and

b) exposing said fluoropolymer to electron beam radiation so as to result in the formation of crosslinks.

2. The method according to claim 1 wherein said method additionally comprises, prior to said step b), the step of:

c) forming said fluoropolymer into a membrane.

3. The method according to claim 1 wherein said membrane has a thickness of 90 microns or less.

4. The method according to claim 1 wherein said step of exposing said fluoropolymer to electron beam radiation comprises exposing said fluoropolymer to greater than 1 Mrad of electron beam radiation.

5. The method according to claim 1 wherein said step of exposing said fluoropolymer to electron beam radiation comprises exposing said fluoropolymer to greater than 3 Mrad of electron beam radiation.

6. The method according to claim 1 wherein said step of exposing said fluoropolymer to electron beam radiation comprises exposing said fluoropolymer to greater than 15 Mrad of electron beam radiation.

7. The method according to claim 1 wherein said highly fluorinated fluoropolymer is perfluorinated.

8. The method according to claim 1 wherein said pendent groups are according to the formula $-R^1-SO_2X$, where R^1 is a branched or unbranched perfluoroalkyl or perfluoroether group comprising 1-15 carbon atoms and 0-4 oxygen atoms, and where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

9. The method according to claim 1 wherein said pendent groups are groups according to the formula $-O-(CF_2)_4-SO_2X$, where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

10. The method according to claim 1 wherein said pendent groups are groups according to the formula $-O-(CF_2)_4-SO_3H$.

11. The method according to claim 1 wherein said halogen atom included in said second pendent groups is Br.

12. The method according to claim 8 wherein said halogen atom included in said second pendent groups is Br.

13. The method according to claim 2 wherein said pendent groups are according to the formula $-R^1-SO_2X$, where R^1 is a branched or unbranched perfluoroalkyl or perfluoroether group comprising 1-15 carbon atoms and 0-4 oxygen atoms, and where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

14. The method according to claim 2 wherein said pendent groups are groups according to the formula $-O-(CF_2)_4-SO_2X$, where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

15. The method according to claim 2 wherein said pendent groups are groups according to the formula -O-$(CF_2)_4$-SO_3H.

16. The method according to claim 2 wherein said halogen atom included in said second pendent groups is Br.

17. The method according to claim 3 wherein said halogen atom included in said second pendent groups is Br.

18. The method according to claim 3 wherein said pendent groups are according to the formula -R^1-SO_2X, where R^1 is a branched or unbranched perfluoroalkyl or perfluoroether group comprising 1-15 carbon atoms and 0-4 oxygen atoms, and where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

19. The method according to claim 3 wherein said pendent groups are groups according to the formula -O-$(CF_2)_4$-SO_2X, where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

20. The method according to claim 3 wherein said pendent groups are groups according to the formula -O-$(CF_2)_4$-SO_3H.

21. The method according to claim 3 wherein said halogen atom included in said second pendent groups is Br.

22. The method according to claim 18 wherein said halogen atom included in said second pendent groups is Br.

23. The method according to claim 4 wherein said pendent groups are according to the formula -R^1-SO_2X, where R^1 is a branched or unbranched perfluoroalkyl or

perfluoroether group comprising 1-15 carbon atoms and 0-4 oxygen atoms, and where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

24. The method according to claim 4 wherein said pendent groups are groups according to the formula $-O-(CF_2)_4-SO_2X$, where X is F, Cl, Br, OH or $-O^-M^+$, where M^+ is a monovalent cation.

25. The method according to claim 4 wherein said pendent groups are groups according to the formula $-O-(CF_2)_4-SO_3H$.

26. The method according to claim 4 wherein said halogen atom included in said second pendent groups is Br.

27. The method according to claim 23 wherein said halogen atom included in said second pendent groups is Br.

28. The method according to claim 1 wherein step c) comprises imbibing said fluoropolymer into a porous supporting matrix.

29. The method according to claim 28 wherein said porous supporting matrix is a porous polytetrafluoroethylene web.

30. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 1.

31. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 2.

32. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 3.

33. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 4.

34. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 5.

35. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 6.

36. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 7.

37. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 8.

38. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 9.

39. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 10.

40. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 11.

41. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 12.

42. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 13.

43. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 14.

44. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 15.

45. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 16.

46. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 17.

47. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 18.

48. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 19.

49. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 20.

50. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 21.

51. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 22.

52. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 23.

53. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 24.

54. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 25.

55. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 26.

56. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 27.

57. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 28.

58. A polymer electrolyte membrane comprising the crosslinked polymer made according to the method of claim 29.

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L1             STR

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L4            50 S L1 AND L3
L5          1051 S L1 AND L3 FUL
               SAV L5 MCC590/A

     FILE 'HCAPLUS' ENTERED AT 12:05:49 ON 03 MAR 2005
L8          2068 S L5
L9           556 S L8(L)PREP/RL
L10          352 S L9 AND (POLYMER? OR PLASTIC?)/SC
L11            2 S L10 AND (ELECTRON(A)BEAM? OR E(A)BEAM?)
L12           40 S L10 AND FUEL(2A)CELL?
L13           40 S L10 AND CROSSLINK?
L14           11 S L13 AND FUEL(2A)CELL?
L15           41 S L14 OR L12 OR L11
L16           20 S L10 AND IODI?
L17            2 S L16 AND (SECOND? OR TWO? OR DOUBLE?)
L18            1 S L15 AND (SECOND? OR TWO? OR DOUBLE?)
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L20           12 S L19 AND FUEL(2A)CELL?
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L26            1 S L25 AND MEMBRAN?
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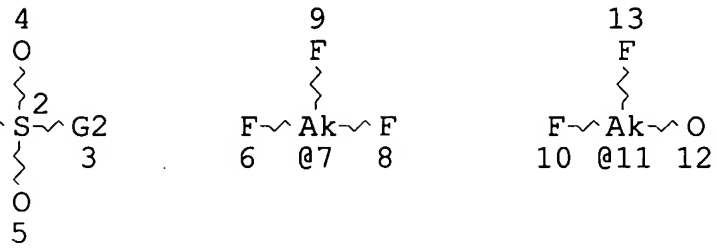

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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE
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L8 2068 SEA FILE=HCAPLUS ABB=ON PLU=ON L5

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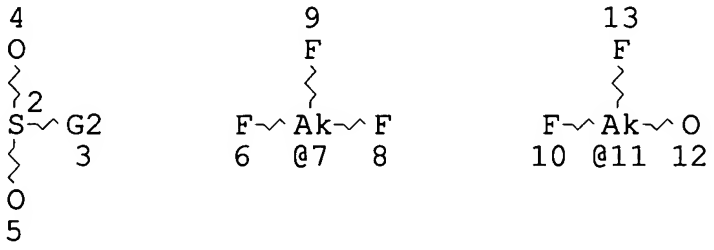

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NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE
L3 SCR 2043
L5 1051 SEA FILE=REGISTRY SSS FUL L1 AND L3
L24 24 SEA FILE=REGISTRY ABB=ON PLU=ON L5 AND 1-3/I
L25 8 SEA FILE=HCAPLUS ABB=ON PLU=ON L24

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L27 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:132104 HCAPLUS
DOCUMENT NUMBER: 139:36909
TITLE: Amplified quenching in metal-organic conjugated polymers
AUTHOR(S): Liu, Yao; Jiang, Shujun; Schanze, Kirk S.
CORPORATE SOURCE: Department of Chemistry, University of Florida, Gainesville, FL, USA
SOURCE: Chemical Communications (Cambridge, United Kingdom) (2003), (5), 650-651
CODEN: CHCOFS; ISSN: 1359-7345
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The luminescence from conjugated polyelectrolytes (CPE)s that contain pendant metal complex units is quenched efficiently by oppositely charged electron acceptors. The polyacetylenes having pendant Ru or Os ligand complex chains and model compds. were prepared by Sonogashira coupling reactions and fully characterized by NMR and mass spectrometry (for the models). Amplified quenching occurs in the conjugated polymers where the lowest excited state has triplet spin character and data suggests that diffusion of the $3\pi,\pi^*$ state along the PPE backbone is not kinetically competitive with alternate pathways for quenching, including self-exchange exciton hopping and/or directed diffusion of the quencher along the polyelectrolyte chain. Comparison of

these results with those obtained on fluorescent CPEs, where amplified quenching involves a singlet exciton, hints that diffusion of the triplet exciton is slow.

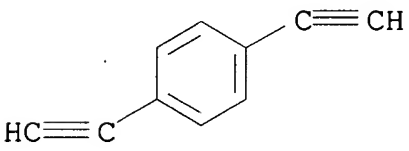
IT **540470-79-9P**
(preparation of monomers and Ru- and Os-butoxy-bipyridyl side chain poly(phenylacetylene) conjugated polyelectrolytes and mechanism of luminescence quenching by electron acceptors)

RN 540470-79-9 HCAPLUS

CN Ruthenium(2+), bis(2,2'-bipyridine-κN1,κN1')[4-[4-[4-(heptyloxy)-2,5-diiodophenoxy]butyl]-4'-methyl-2,2'-bipyridine-κN1,κN1']-, (OC-6-33)-, salt with trifluoromethanesulfonic acid (1:2), polymer with 1,4-diethynylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 935-14-8
CMF C10 H6

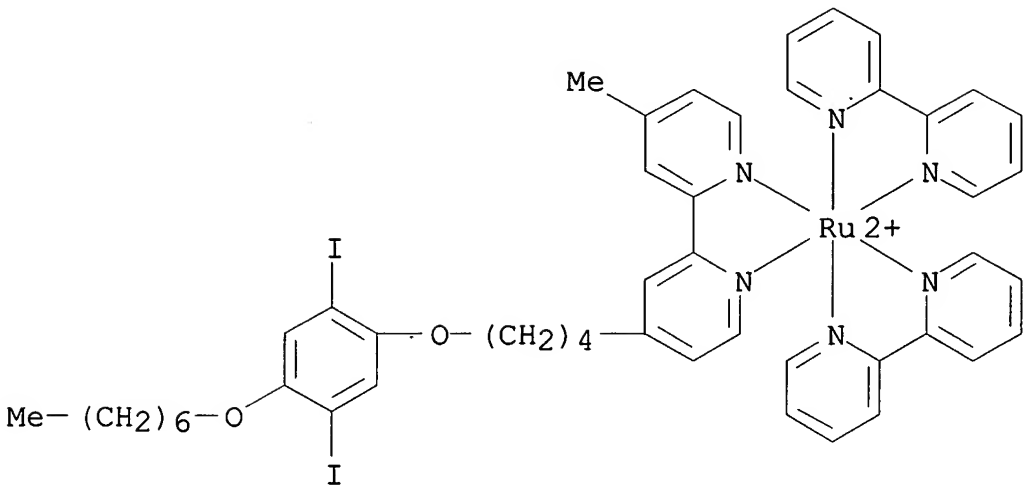


CM 2

CRN 540470-70-0
CMF C48 H50 I2 N6 O2 Ru . 2 C F3 O3 S

CM 3

CRN 540470-69-7
CMF C48 H50 I2 N6 O2 Ru
CCI CCS



CM 4

CRN 37181-39-8
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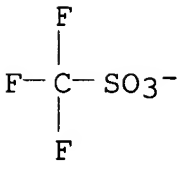


CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36, 73
IT 540470-48-2P 540470-60-8P **540470-79-9P** 540470-80-2P
(preparation of monomers and Ru- and Os-butoxy-bipyridyl side chain poly(phenylacetylene) conjugated polyelectrolytes and mechanism of luminescence quenching by electron acceptors)
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:957151 HCAPLUS
DOCUMENT NUMBER: 138:311425
TITLE: Acid catalyst mobility in resist resins
AUTHOR(S): Stewart, Michael D.; Tran, Hoang Vi; Schmid, Gerard M.; Stachowiak, Timothy B.; Becker, Darren J.; Willson, C. Grant

CORPORATE SOURCE: Department of Chemical Engineering, The University of Texas at Austin, Austin, TX, 78712, USA
SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (2002), 20(6), 2946-2952
CODEN: JVTBD9; ISSN: 0734-211X
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB In a chemical amplified resist absorbed photons generate stable catalyst mols. instead of directly switching resist solubility via photochem. reaction. This allows for much lower exposure doses to be used in imaging. Some catalyst mobility is necessary to achieve amplification since the catalyst must move from reaction site to reaction site, but a mobile catalyst can blur the deposited aerial image. Catalyst mols. that are free to move in exposed regions are also free to move into adjacent unexposed regions. Understanding acid catalyst diffusion in photoresist resins is complicated by the constantly changing chemical environment the diffusing catalyst experiences as the resist undergoes chemical reactions. The diffusing catalyst promotes chemical reactions which change the properties of its surrounding resin. In addition, it is possible a transient material state is generated by volatile reaction byproducts and their desorption from the film. In most photoresist systems it is impossible to sep. reaction and diffusion effects. This work describes studies of acid diffusion in polymers that are close structural analogs to reactive photoresist resins but do not react with the diffusing acidic catalyst. The purpose of this study into nonreactive polymer is to gain insight into the more complex, reactive systems. In addition, expts. with polymeric photoacid generators are reported. These materials provide added insight into acid transport in photoresist materials.

IT **509100-87-2**
(polymeric photoacid generator; diffusion of acid mols. in polymers in relation to mobility of photogenerated acid in chemical amplified photoresists)

RN 509100-87-2 HCAPLUS

CN Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-phenoxy-, compd. with ethenylbenzene polymer with 1-ethenyl-4-(methylthio)benzene, and iodomethane (9CI) (CA INDEX NAME)

CM 1

CRN 509100-86-1
CMF C8 H6 F4 O4 S . Li

PhO—CF_2—CF_2—SO_3H

● Li

CM 2

CRN 74-88-4
CMF C H3 I

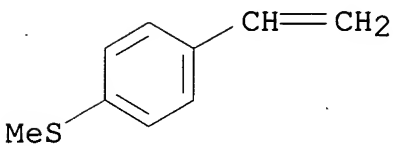
H_3C—I

CM 3

CRN 29324-56-9
CMF (C9 H10 S . C8 H8)x
CCI PMS

CM 4

CRN 18760-11-7
CMF C9 H10 S



CM 5

CRN 100-42-5
CMF C8 H8

H_2C═CH—Ph

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and

Other Reprographic Processes)
IT 252975-70-5D, dimethylphenylsulfonium ion exchange
509100-87-2
(polymeric photoacid generator; diffusion of acid mols. in polymers in relation to mobility of photogenerated acid in chemical amplified photoresists)
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:628185 HCAPLUS
DOCUMENT NUMBER: 133:223513
TITLE: Fluorinated copolymers from preemulsified comonomers and method for free radical polymerization thereof
INVENTOR(S): Bekiarian, Paul Gregory; Farnham, William Brown
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours & Co., USA
SOURCE: PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000052060	A1	20000908	WO 2000-US5526	2000 0302
W: AU, CA, CN, FI, JP, KR, MX, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
CA 2362289	AA	20000908	CA 2000-2362289	2000 0302
EP 1165624	A1	20020102	EP 2000-913714	2000 0302
EP 1165624	B1	20041208		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002538235	T2	20021112	JP 2000-602283	2000 0302
AT 284418	E	20041215	AT 2000-913714	

					2000 0302
US 6602968	B1	20030805	US 2001-913057		2001 0808
PRIORITY APPLN. INFO.:			US 1999-122354P	P	1999 0302
			WO 2000-US5526	W	2000 0302

AB The method comprises copolymg. in aqueous emulsion one or more monomers selected from tetrafluoroethylene (TFE), trifluoroethylene, vinylidene fluoride, vinyl fluoride, ethylene, chlorotrifluoroethylene, hexafluoropropylene, perfluoromethyl vinyl ether, and perfluoroethyl vinyl ether with a fluorinated comonomer having limited water solubility, in the presence of a fluorinated surfactant and free-radical initiator. The comonomer is dispersed in the form of droplets of ≤10 μ size and preferably is perfluorosulfonate ethoxypropyl vinyl ether (PSEPVE). The copolymer preferably is hydrolyzed using a basic solution to provide the alkali metal cationic form of the ionomer, and can be melt processed into a film or sheet. The copolymers having certain ionic conductivity, water swelling and effective ionic concentration, are useful in electrochem. applications such as lithium batteries, polymer electrolyte membrane **fuel cells**, electrolysis **cells**, ion-exchange membranes, sensors, electrochem. capacitors, and modified electrodes, and strong acid catalysts (no data). Thus, 150 g PSEPVE aqueous emulsion, 13.2 g ammonium perfluorooctanoate, and 0.9 g potassium persulfate solution in 20 mL water was polymerized under 200 psi TFE at 60° for 1.23 h to obtain a clear, water-white latex containing 16% polymer solids, which was frozen, defrosted, washed and dried to yield 320 g fine polymer powder. The above polymer was melt pressed at 320° and 5 klb pressure to obtain a clear film (2.5-3.5 mil) which was hydrolyzed in a 0.5 M solution of LiOH in 1:2 DMSO:H2O at 70° for 4 h, washed, acid-exchanged in 1.0 M nitric, and washed to obtain a membrane having water uptake 15 weight% and ionic conductivity at 23° 65 mS/cm.

IT **62879-78-1DP**, hydrolyzed **62879-78-1P** **291750-38-4P** **291750-39-5P**
(fluoropolymers from preemulsified comonomers and free-radical polymerization thereof)

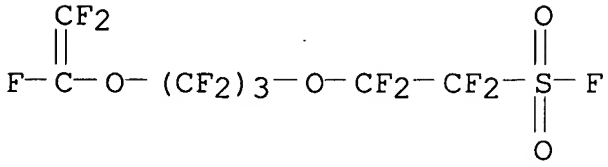
RN 62879-78-1 HCAPLUS

CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-[1,1,2,2,3,3-

hexafluoro-3-[(trifluoroethenyl)oxy]propoxy]-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

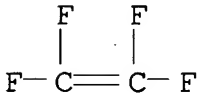
CM 1

CRN 62879-77-0
CMF C7 F14 O4 S



CM 2

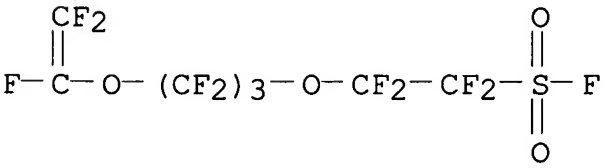
CRN 116-14-3
CMF C2 F4



RN 62879-78-1 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-[1,1,2,2,3,3-hexafluoro-3-[(trifluoroethenyl)oxy]propoxy]-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

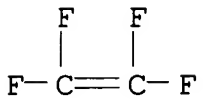
CM 1

CRN 62879-77-0
CMF C7 F14 O4 S



CM 2

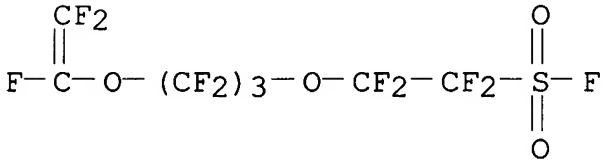
CRN 116-14-3
CMF C2 F4



RN 291750-38-4 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-[1,1,2,2,3,3-hexafluoro-3-[(trifluoroethenyl)oxy]propoxy]-, polymer with 1,1-difluoroethene (9CI) (CA INDEX NAME)

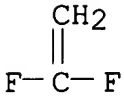
CM 1

CRN 62879-77-0
CMF C7 F14 O4 S



CM 2

CRN 75-38-7
CMF C2 H2 F2

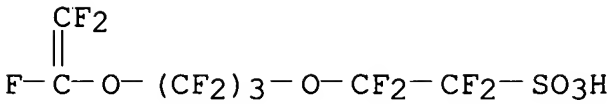


RN 291750-39-5 HCAPLUS
CN Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,1,2,2,3,3-hexafluoro-3-[(trifluoroethenyl)oxy]propoxy]-, lithium salt, polymer with 1,1-difluoroethene (9CI) (CA INDEX NAME)

CM 1

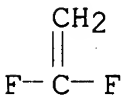
CRN 97008-86-1

CMF C7 H F13 O5 S . Li



CM 2

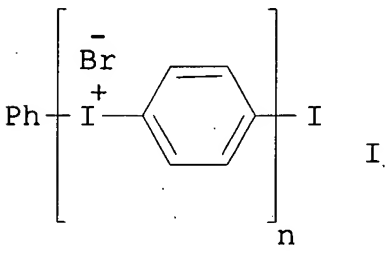
CRN 75-38-7
CMF C2 H2 F2



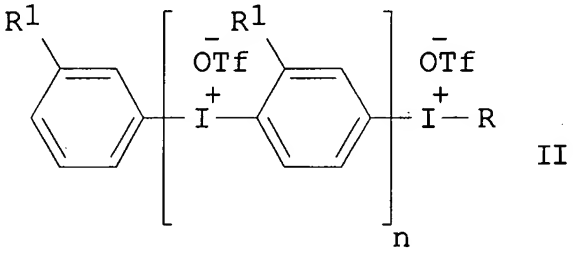
IC ICM C08F002-18
ICS C08F214-22; C08F214-26
CC 37-3 (**Plastics** Manufacture and Processing)
Section cross-reference(s): 38, 52, 72, 76
ST perfluorosulfonate ethoxypropyl vinyl ether copolymer prepn; tetrafluoroethylene preemulsified comonomer polymn; ammonium perfluorooctanoate surfactant preemulsified comonomer polymn; electrolyte membrane **fuel cell** fluorinated copolymer; ion exchange membrane ionic fluoropolymer; sensor perfluoro vinyl ether tetrafluoroethylene copolymer; electrode modified ionic fluoropolymer; acid catalyst ionic fluoropolymer
IT Chemically modified electrodes
Electrolytic capacitors
Electrolytic cells
Fuel cells
Ion exchange membranes
(fluoropolymers from preemulsified comonomers and free-radical polymerization thereof)
IT **Secondary** batteries
(lithium; fluoropolymers from preemulsified comonomers and free-radical polymerization thereof)
IT **62879-78-1DP**, hydrolyzed **62879-78-1P** **291750-38-4P** **291750-39-5P**
(fluoropolymers from preemulsified comonomers and free-radical

polymerization thereof)
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1999:342971 HCAPLUS
DOCUMENT NUMBER: 131:129715
TITLE: Oligomerization of (Diacetoxyiodo)benzene with Trifluoromethanesulfonic Acid. Preparation and Structure of Hypervalent Iodine Oligomers
AUTHOR(S): Kitamura, Tsugio; Wakimoto, Ichiro; Nakamura, Tetsu; Fujiwara, Yuzo
CORPORATE SOURCE: Department of Chemistry and Biochemistry Graduate School of Engineering, Kyushu University, Hakozaki Fukuoka, 812-8581, Japan
SOURCE: Organic Letters (1999), 1(2), 253-255
CODEN: ORLEF7; ISSN: 1523-7060
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
GI



I



II

AB Treatment of (diacetoxyiodo)benzene with an excess amount of trifluoromethanesulfonic acid (TfOH) gave hypervalent iodine oligomer I after quenching by aqueous NaBr. Thermolysis of I with KI yielded p-diiodobenzene and iodobenzene, indicating that I is an oligomer of para-substituted benzene rings connected through iodonium moieties. Iodine oligomers generated in situ react with benzene, toluene, and chlorobenzene to give the corresponding arylated iodine oligomers II (R = Ph, 4-MeC6H4, 4-ClC6H4; R1 = H). Reaction of 3-MeC6H4I(OAc)2 with triflic acid followed by quenching with NaBr gave the oligomer II (R = I; R1 = Me) (no data); upon degradation with KI, II (R = I; R1 = Me) gave 3-MeC6H4I

and 2,5-diiodotoluene, showing that polymerization occurs para to the iodonium moiety.

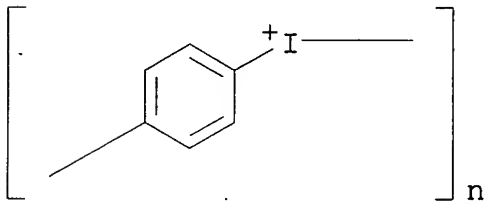
IT **234114-94-4DP**, reaction product with benzene
(oligomeric; preparation of arylated hypervalent iodine oligomers by
electrophilic regioselective polymerization of diacetoxyiodobenzene and arylation with benzene, toluene, or chlorobenzene)

RN 234114-94-4 HCAPLUS

CN Poly[iodoniumylidene-1,4-phenylene salt with trifluoromethanesulfonic acid (1:1)] (9CI) (CA INDEX NAME)

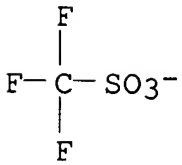
CM 1

CRN 234114-93-3
CMF (C6 H4 I)n
CCI PMS



CM 2

CRN 37181-39-8
CMF C F3 O3 S



(oligomeric; prepn. of hypervalent iodine oligomers by electrophilic regioselective polymn. of diacetoxyiodobenzene

IT **234114-94-4P**
(oligomeric; preparation of hypervalent iodine oligomers by electrophilic regioselective polymerization of diacetoxyiodobenzene)

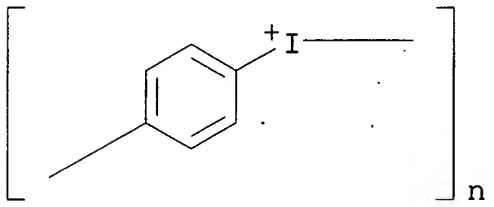
RN 234114-94-4 HCAPLUS

CN Poly[iodoniumylidene-1,4-phenylene salt with

trifluoromethanesulfonic acid (1:1)] (9CI) (CA INDEX NAME)

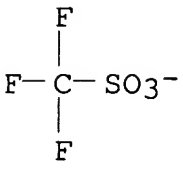
CM 1

CRN 234114-93-3
CMF (C6 H4 I)n
CCI PMS



CM 2

CRN 37181-39-8
CMF C F3 O3 S



IT **234778-70-2DP**, bromide-exchanged
(oligomeric; regiochem. of the preparation of hypervalent iodine oligomers by electrophilic polymerization of diacetoxyiodobenzene)
RN 234778-70-2 HCAPLUS
CN Poly[iodoniumylidene(methyl-1,4-phenylene) salt with trifluoromethanesulfonic acid (1:1)] (9CI) (CA INDEX NAME)

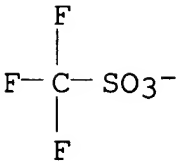
CM 1

CRN 234777-41-4
CMF (C7 H6 I)n
CCI IDS, PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 37181-39-8
CMF C F3 O3 S



CC 25-3 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
IT **234114-94-4DP,** reaction product with benzene
234114-94-4DP, reaction product with chlorobenzene
234114-94-4DP, reaction product with toluene
(oligomeric; preparation of arylated hypervalent iodine oligomers by
electrophilic regioselective polymerization of diacetoxyiodobenzene and arylation with benzene, toluene, or chlorobenzene)
IT **234114-94-4DP,** bromide-exchanged
(oligomeric; preparation of hypervalent iodine oligomers by electrophilic regioselective polymerization of diacetoxyiodobenzene)
IT **234114-94-4P**
(oligomeric; preparation of hypervalent iodine oligomers by electrophilic regioselective polymerization of diacetoxyiodobenzene)
IT **234778-70-2DP,** bromide-exchanged
(oligomeric; regiochem. of the preparation of hypervalent iodine oligomers by electrophilic polymerization of diacetoxyiodobenzene)
REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1996:259816 HCAPLUS
DOCUMENT NUMBER: 124:317967
TITLE: Transformation of the Cationic Growing Center of Poly(tetrahydrofuran) into Samarium Amide. Block Copolymerization of Tetrahydrofuran with Methyl Methacrylate
AUTHOR(S): Nomura, Ryoji; Narita, Mamiko; Endo, Takeshi
CORPORATE SOURCE: Research Laboratory of Resources Utilization, Tokyo Institute of Technology, Yokohama, 226, Japan
SOURCE: Macromolecules (1996), 29(11), 3669-73
CODEN: MAMOBX; ISSN: 0024-9297
PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal
LANGUAGE: English

AB **Two**-electron reduction of N-tert-butyl-N-methylaziridinium trifluoromethanesulfonate with samarium(II) **iodide** in the presence of hexamethylphosphoramide gave the corresponding samarium amides in an excellent yield through the reductive cleavage of a carbon-nitrogen bond of the ring followed by the elimination of ethylene. The produced samarium amide could polymerize Me methacrylate (MMA) in high initiation efficiency (80%), leading to the formation of highly syndiotactic poly(MMA) (85%) with narrow mol. weight distribution (<1.19). End capping of living poly(THF) with N-tert-butylaziridine and sequential reduction by samarium(II) **iodide** resulted in the corresponding poly(THF) with samarium amide moiety at the polymer end at functionality of 48%. The polymerization of MMA with the terminal samarium amide produced the block copolymer of THF with MMA.

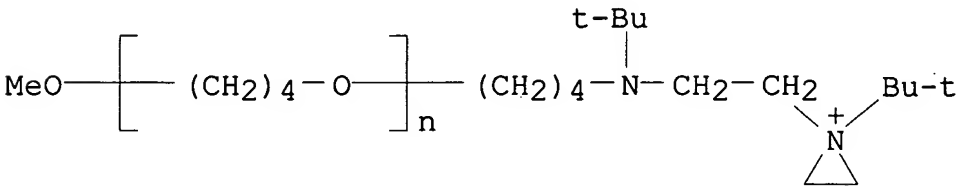
IT **176259-77-1DP**, hydrolyzed or reaction product with benzoyl chloride
(preparation and NMR characterization of aziridinium-terminated poly(THF) prepolymer for subsequent block polymerization with Me methacrylate)

RN 176259-77-1 HCAPLUS

CN Poly(oxy-1,4-butanediyl), α-[4-[(1,1-dimethylethyl)[2-[1-(1,1-dimethylethyl)aziridinio]ethyl]amino]butyl]-ω-methoxy-, salt with trifluoromethanesulfonic acid (1:1) (9CI) (CA INDEX NAME)

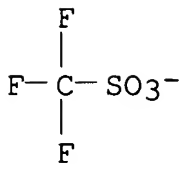
CM 1

CRN 176259-76-0
CMF (C4 H8 O)n C17 H37 N2 O
CCI PMS



CM 2

CRN 37181-39-8
CMF C F3 O3 S



CC 35-3 (Chemistry of Synthetic High **Polymers**)
ST polytetrahydrofuran growing center transformation samarium amide; samarium amide terminated polytetrahydrofuran polymn methacrylate; aziridinium redn samarium **iodide** catalyst prepn; methacrylate polymn samarium amide catalyst
IT 49690-12-2P, N-tert-Butyl-N-methylbenzamide
(model study; preparation by **two**-electron reduction of N-tert-butyl-N-methylaziridinium)
IT 176259-79-3, N-tert-Butyl-N-methyl-methylaziridinium trifluoromethanesulfonate 176259-80-6, N-Benzyl-N-methylaziridinium trifluoromethanesulfonate 176259-82-8, N-Benzyl-N-methyl-methylaziridinium trifluoromethanesulfonate
(model study; **two**-electron reduction with SmI2 of)
IT **176259-77-1DP**, hydrolyzed or reaction product with benzoyl chloride
(preparation and NMR characterization of aziridinium-terminated poly(THF) prepolymer for subsequent block polymerization with Me methacrylate)
IT 32248-43-4, Samarium(II) **iodide**
(**two**-electron reduction of N,N-dialkylaziridinium salts or N,N-dialkylaziridinium salt-terminated poly(THF) with)
IT 680-31-9, Hexamethylphosphoramide, uses
(**two**-electron reduction of N,N-dialkylaziridinium salts or N,N-dialkylaziridinium salt-terminated poly(THF) with SmI2 in the presence of)
IT 76343-13-0, N-tert-Butyl-N-methylaziridinium trifluoromethanesulfonate
(**two**-electron reduction with SmI2 and application as a catalyst precursor in the polymerization of methacrylates)

L27 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1995:499725 HCAPLUS
DOCUMENT NUMBER: 123:44388
TITLE: Silicon-containing sulfonium salts and photoresist compositions
INVENTOR(S): Iwasa, Shigeyuki; Nakano, Kaichiro; Maeda, Katsumi; Hasegawa, Etsuo
PATENT ASSIGNEE(S): Nippon Electric Co, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06342209	A2	19941213	JP 1993-204357	19930818
US 5747622	A	19980505	US 1997-797939	19970212

PRIORITY APPLN. INFO.:

JP 1993-78403	A	19930406
JP 1993-204357	A	19930818
JP 1993-329366	A	19931227
US 1994-223767	B1	19940406

AB The salts contain p-ZO(C6H4-S+R1Y--C6H4-p-OX)n(R4OX)kZ [n = 10-700; k = 0, 1-700; n + k = 10-700;1 k/n + k = 0-0.9; X = (SiR2R3)mO or (SiR2R3O)m-1SiR2R3O; m = 1-100; Y- = counter ion; Z = H, trimethylsilyl; R1-3 = Ph, C1-6 alkyl(-containing Ph); R4 = C2-8 alkylene, phenylene]. The compns. contain the salts as acid generators.

IT **164580-15-8P 164580-22-7P 164580-23-8P 164580-24-9P 164580-26-1P 329321-82-6P 329321-85-9P 329322-05-6P 329322-16-9P 329322-18-1P 329322-33-0P**
(photoresist compns. containing Si-containing polymer sulfonium salts as acid generators)

RN 164580-15-8 HCAPLUS

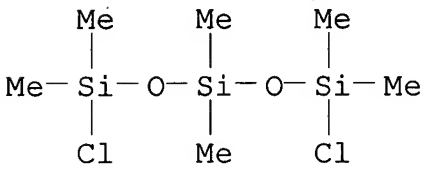
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd. with 1,5-dichloro-1,1,3,3,5,5-hexamethyltrisiloxane polymer with 4,4'-thiobis[phenol] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 329697-15-6
CMF (C12 H10 O2 S . C6 H18 Cl2 O2 Si3)x
CCI PMS

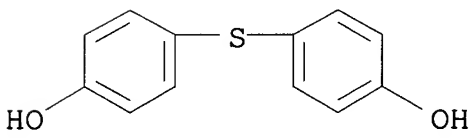
CM 2

CRN 3582-71-6
CMF C6 H18 Cl2 O2 Si3



CM 3

CRN 2664-63-3
CMF C12 H10 O2 S

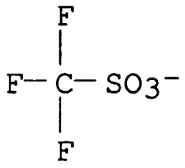


CM 4

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

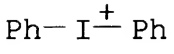
CM 5

CRN 37181-39-8
CMF C F3 O3 S



CM 6

CRN 10182-84-0
CMF C12 H10 I



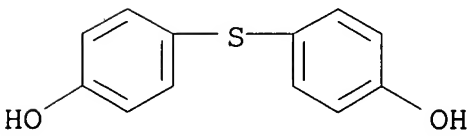
RN 164580-22-7 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd. with 1,4-cyclohexanediol polymer with 1,7-dichloro-1,1,3,3,5,5,7,7-octamethyltetrasiloxane and 4,4'-thiobis[phenol] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 329695-82-1
CMF (C12 H10 O2 S . C8 H24 Cl2 O3 Si4 . C6 H12 O2)x
CCI PMS

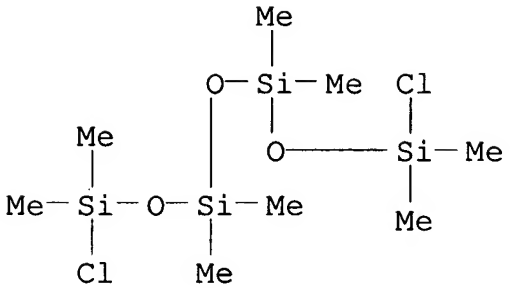
CM 2

CRN 2664-63-3
CMF C12 H10 O2 S



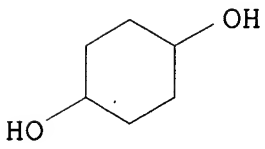
CM 3

CRN 2474-02-4
CMF C8 H24 Cl2 O3 Si4



CM 4

CRN 556-48-9
CMF C6 H12 O2

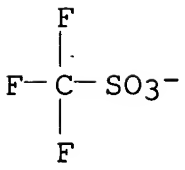


CM 5

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

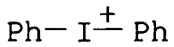
CM 6

CRN 37181-39-8
CMF C F3 O3 S



CM 7

CRN 10182-84-0
CMF C12 H10 I



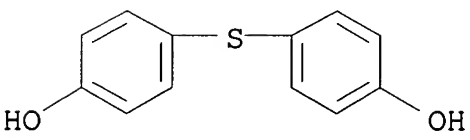
RN 164580-23-8 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd. with 1,4-benzenediol polymer with 1,7-dichloro-1,1,3,3,5,5,7,7-octamethyltetrasiloxane and 4,4'-thiobis[phenol] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 329692-92-4
CMF (C12 H10 O2 S . C8 H24 Cl2 O3 Si4 . C6 H6 O2)x
CCI PMS

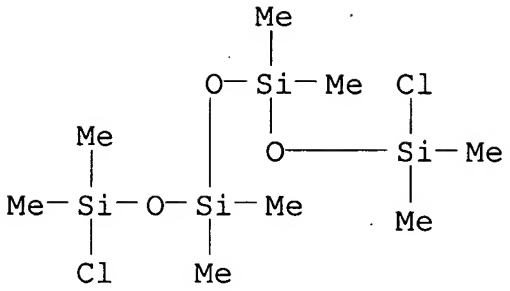
CM 2

CRN 2664-63-3
CMF C12 H10 O2 S



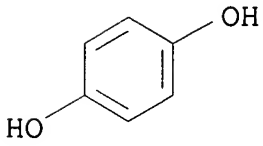
CM 3

CRN 2474-02-4
CMF C8 H24 Cl2 O3 Si4



CM 4

CRN 123-31-9
CMF C6 H6 O2

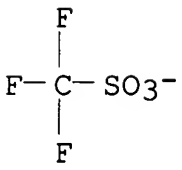


CM 5

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

CM 6

CRN 37181-39-8
CMF C F3 O3 S



CM 7

CRN 10182-84-0

CMF C12 H10 I

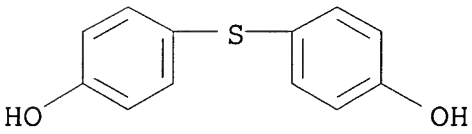
RN 164580-24-9 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd. with 1,7-dichloro-1,1,3,3,5,5,7,7-octamethyltetrasiloxane polymer with 4,4'-thiobis[phenol] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 329697-16-7
CMF (C12 H10 O2 S . C8 H24 Cl2 O3 Si4)x
CCI PMS

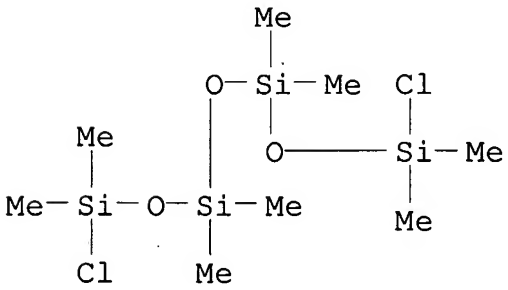
CM 2

CRN 2664-63-3
CMF C12 H10 O2 S



CM 3

CRN 2474-02-4
CMF C8 H24 Cl2 O3 Si4

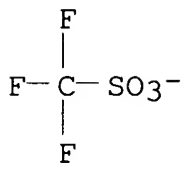


CM 4

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

CM 5

CRN 37181-39-8
CMF C F3 O3 S



CM 6

CRN 10182-84-0
CMF C12 H10 I

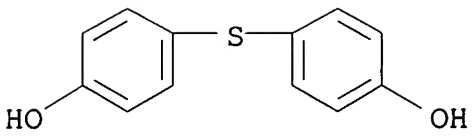
RN 164580-26-1 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd. with 1,4-cyclohexanedimethanol polymer with 1,7-dichloro-1,1,3,3,5,5,7,7-octamethyltetrasiloxane and 4,4'-thiobis[phenol] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 329696-01-7
CMF (C12 H10 O2 S . C8 H24 Cl2 O3 Si4 . C8 H16 O2)x
CCI PMS

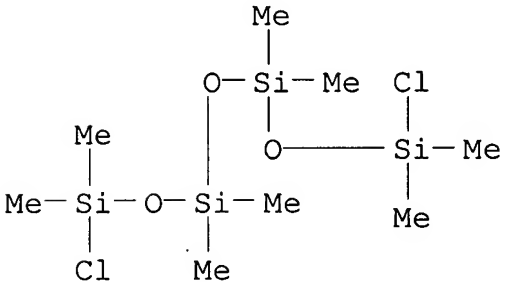
CM 2

CRN 2664-63-3
CMF C12 H10 O2 S



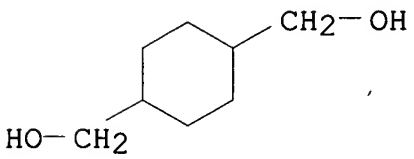
CM 3

CRN 2474-02-4
CMF C8 H24 Cl2 O3 Si4



CM 4

CRN 105-08-8
CMF C8 H16 O2

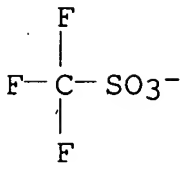


CM 5

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

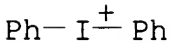
CM 6

CRN 37181-39-8
CMF C F3 O3 S



CM 7

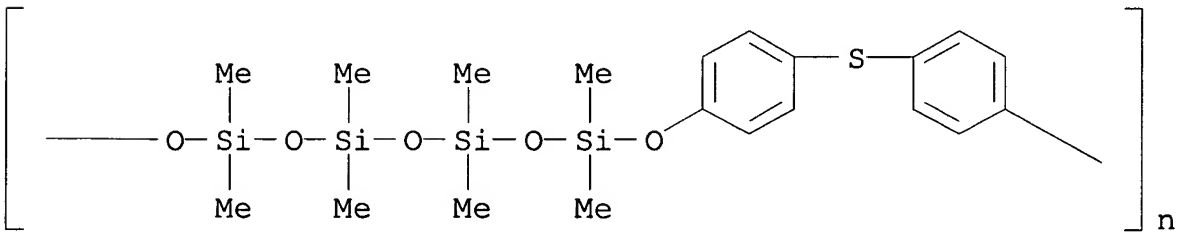
CRN 10182-84-0
CMF C12 H10 I



RN 329321-82-6 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd with poly[oxy(1,1,3,3,5,5,7,7-octamethyl-1,7-tetrasiloxanediyl)oxy-1,4-phenylenethio-1,4-phenylene] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 560127-41-5
CMF (C20 H32 O5 S Si4)n
CCI PMS

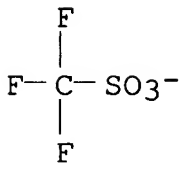


CM 2

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

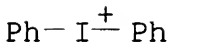
CM 3

CRN 37181-39-8
CMF C F3 O3 S



CM 4

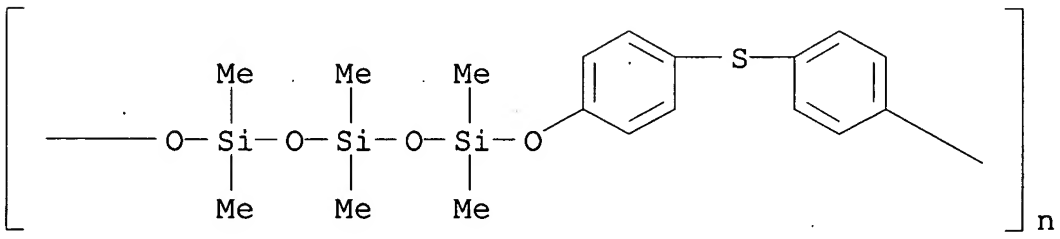
CRN 10182-84-0
CMF C12 H10 I



RN 329321-85-9 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd. with poly[oxy(1,1,3,3,5,5-hexamethyl-1,5-trisiloxanediyl)oxy-1,4-phenylenethio-1,4-phenylene] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 605665-94-9
CMF (C18 H26 O4 S Si3)n
CCI PMS

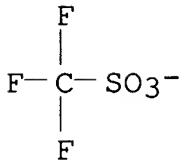


CM 2

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

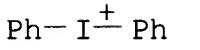
CM 3

CRN 37181-39-8
CMF C F3 O3 S



CM 4

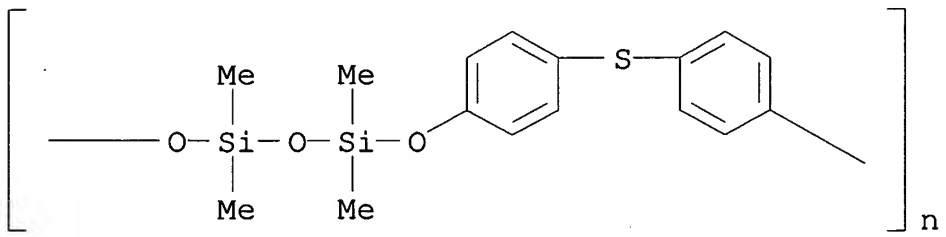
CRN 10182-84-0
CMF C12 H10 I



RN 329322-05-6 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd with poly[oxy(1,1,3,3-tetramethyl-1,3-disiloxanediyl)oxy-1,4-phenylenethio-1,4-phenylene] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 560124-63-2
CMF (C16 H20 O3 S Si2)n
CCI PMS

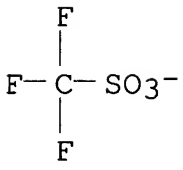


CM 2

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

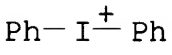
CM 3

CRN 37181-39-8
CMF C F3 O3 S



CM 4

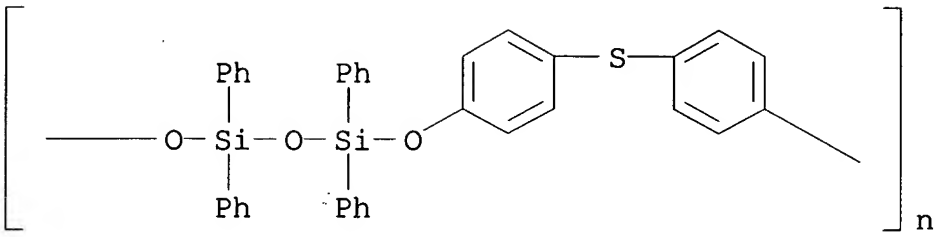
CRN 10182-84-0
CMF C12 H10 I



RN 329322-16-9 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd with poly[oxy(1,1,3,3-tetraphenyl-1,3-disiloxanediyl)oxy-1,4-phenylenethio-1,4-phenylene] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 560123-19-5
CMF (C36 H28 O3 S Si2)n
CCI PMS

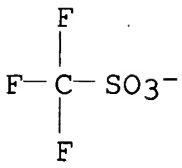


CM 2

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

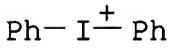
CM 3

CRN 37181-39-8
CMF C F3 O3 S



CM 4

CRN 10182-84-0
CMF C12 H10 I

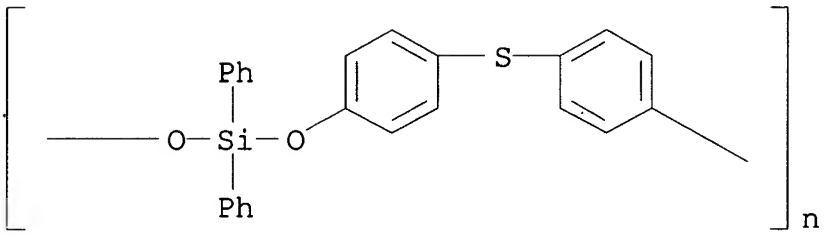


RN 329322-18-1 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd with poly[oxy(diphenylsilylene)oxy-1,4-phenylenethio-1,4-phenylene] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 560128-59-8

CMF (C24 H18 O2 S Si)n
CCI PMS

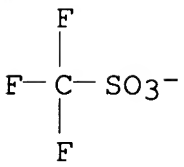


CM 2

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

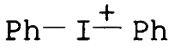
CM 3

CRN 37181-39-8
CMF C F3 O3 S



CM 4

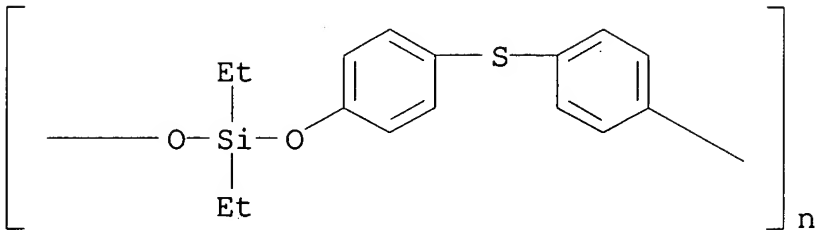
CRN 10182-84-0
CMF C12 H10 I



RN 329322-33-0 HCAPLUS
CN Iodonium, diphenyl-, salt with trifluoromethanesulfonic acid, compd with poly[oxy(diethylsilylene)oxy-1,4-phenylenethio-1,4-phenylene] (1:1:?) (9CI) (CA INDEX NAME)

CM 1

CRN 560125-95-3
CMF (C16 H18 O2 S Si)n
CCI PMS

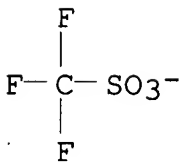


CM 2

CRN 66003-76-7
CMF C12 H10 I . C F3 O3 S

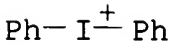
CM 3

CRN 37181-39-8
CMF C F3 O3 S



CM 4

CRN 10182-84-0
CMF C12 H10 I



IC ICM G03F007-004
ICS G03F007-031; G03F007-039; G03F007-075; H01L021-027

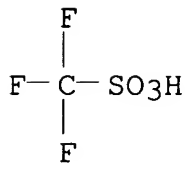
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
IT 132852-30-3P **164580-15-8P 164580-22-7P 164580-23-8P 164580-24-9P 164580-26-1P 329321-82-6P 329321-85-9P 329322-05-6P 329322-16-9P 329322-18-1P 329322-33-0P**
(photoresist compns. containing Si-containing polymer sulfonium salts as acid generators)

L27 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1994:681382 HCAPLUS
DOCUMENT NUMBER: 121:281382
TITLE: Radiofrequency plasma polymerization of perfluoroionomer membrane materials
AUTHOR(S): Danilich, Michael J.; Gervasio, Dominic F.; Marchant, Roger E.
CORPORATE SOURCE: Dep. Macromol. Sci., Case Western Reserve Univ., Cleveland, OH, 44106, USA
SOURCE: Journal of Applied Polymer Science: Applied Polymer Symposium (1994), 54(Plasma Deposition of Polymeric Thin Films), 93-105
CODEN: JPSSDD; ISSN: 0271-9460
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Radiofrequency plasma polymerization was investigated as a method to prepare ionically conductive membrane materials for biomedical sensors. Plasma copolymers of chlorotrifluoroethylene (CTFE) and trifluoromethanesulfonic acid (TFMSA) exhibited ionic conductivity three to four orders of magnitude higher than the water used to make the measurement, and gave ATR-FTIR and ESCA evidence for retained sulfonic acid groups. Plasma homopolymns. of CTFE and perfluoroallylphosphonic acid (PAPA) were investigated to determine suitable conditions for plasma copolymn. of the **two** monomers. Plasma homopolymd. CTFE had deposition rates varying from 4400 Å/h to 100 Å/h, was extremely hydrophobic, and showed spectroscopic evidence for a lightly branched, crosslinked fluorocarbon structure. Plasma homopolymd. PAPA deposited uniformly at approx. 780 Å/h, was extremely hydrophilic, and showed spectroscopic evidence for retained phosphonic acid groups. Plasma-polymerized PAPA had ionic conductivity **two** orders of magnitude higher than that of the water used to make the measurement. Increasing the discharge pressure from 30 mTorr to 100 mTorr resulted in decreased deposition rate for plasma homopolymd. CTFE and decreased monomer fragmentation in plasma-homopolymd. PAPA.
IT **121115-61-5P**

(properties of plasma-prepared membranes of)
RN 121115-61-5 HCAPLUS
CN Methanesulfonic acid, trifluoro-, polymer with chlorotrifluoroethene (9CI) (CA INDEX NAME)

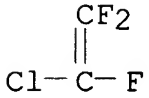
CM 1

CRN 1493-13-6
CMF C H F3 O3 S



CM 2

CRN 79-38-9
CMF C2 Cl F3



CC 35-7 (Chemistry of Synthetic High **Polymers**)
Section cross-reference(s): 38, 76
IT Contact angle
(of methylene **iodide** or water on fluoropolymer membranes)
IT 75-11-6, Methylene **iodide** 7732-18-5, Water, uses
(contact angle of methylene **iodide** or water on fluoropolymer membranes)
IT 9002-83-9P, Chlorotrifluoroethylene homopolymer
121115-61-5P 154075-47-5P
(properties of plasma-prepared membranes of)

L27 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1988:130966 HCAPLUS
DOCUMENT NUMBER: 108:130966
TITLE: Copper-induced telomerization of tetrafluoroethylene with fluoroalkyl iodides
AUTHOR(S): Chen, Qingyun; Su, Debao; Yang, Zhenyu; Zhu,

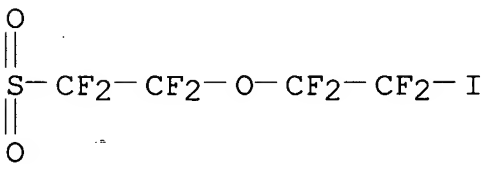
Rongxian
CORPORATE SOURCE: Shanghai Inst. Org. Chem., Acad. Sin., Shanghai, Peop. Rep. China
SOURCE: Journal of Fluorine Chemistry (1987), 36(4), 483-9
CODEN: JFLCAR; ISSN: 0022-1139
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 108:130966

AB In the presence of catalytic amts. of copper, the telomerization of CF2:CF2 with fluoroalkyl iodides, e.g., CF3CF2I and Cl(CF2)4 I, was carried out at 80-100°. This is a much lower temperature range than usually required for telomerization (.apprx.200°). The reaction times in the catalytic procedure were also much shorter.

IT **66138-66-7P**
(preparation of)
RN 66138-66-7 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-(1,1,2,2-tetrafluoro-2-iodoethoxy)-, telomer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 66137-74-4
CMF C4 F9 I O3 S

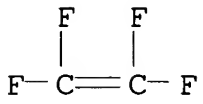


CM 2

CRN 9002-84-0
CMF (C2 F4)x
CCI PMS

CM 3

CRN 116-14-3
CMF C2 F4

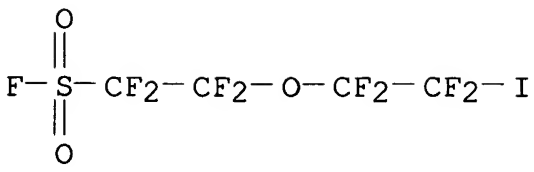


CC 23-3 (Aliphatic Compounds)
IT 355-43-1P 423-39-2P 423-62-1P 507-63-1P 16486-97-8P
16486-98-9P 16486-99-0P 25398-32-7P **66138-66-7P**
67990-76-5P 67990-77-6P 68136-90-3P 113151-62-5P
113412-58-1P
(preparation of)

L27 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1982:162080 HCAPLUS
DOCUMENT NUMBER: 96:162080
TITLE: Perfluoro-ω-iodo-3-oxaalkanesulfonyl fluorides as intermediates for surfactants and vinyl compounds
AUTHOR(S): Bargigia, G. A.; Caporiccio, G.; Pianca, M.
CORPORATE SOURCE: Cent. Ric. Sviluppo, Montedison Group, Milan, 20138, Italy
SOURCE: Journal of Fluorine Chemistry (1982), 19(3-6), 403-10
CODEN: JFLCAR; ISSN: 0022-1139
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 96:162080
AB FOCCF2SO2F quant. formed from SO3 and C2F4 through tetrafluoroethanesultone, was converted into ICF2CF2OCF2CF2SO2F by alkali fluoride, iodine and C2F4 in aprotic solvents. From the iodo compound were derived C2F4 telomers having both fluorosulfonyl and iodo terminal groups. These telomers were easily converted into the surfactants CF3CF2(CF2CF2)nOCF2CF2SO3M (M = alkali) by fluorination, and into the vinyl derivs. CF2:CF(CF2CF2)nOCF2CF2SO2F by dehalogenation.
IT **66138-68-9P**
(preparation of)
RN 66138-68-9 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-(1,1,2,2-tetrafluoro-2-iodoethoxy)-, telomer with 1,1,2,3,3,3-hexafluoro-1-propene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 66137-74-4
CMF C4 F9 I O3 S

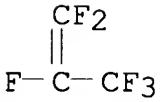


CM 2

CRN 25067-11-2
CMF (C3 F6 . C2 F4)x
CCI PMS

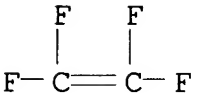
CM 3

CRN 116-15-4
CMF C3 F6



CM 4

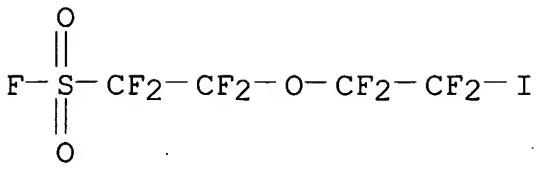
CRN 116-14-3
CMF C2 F4



IT **66138-68-9DP**, fluorination and dehalogenation products (preparation of, as surfactant)
RN 66138-68-9 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-(1,1,2,2-tetrafluoro-2-iodoethoxy)-, telomer with 1,1,2,3,3,3-hexafluoro-1-propene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 66137-74-4
CMF C4 F9 I O3 S

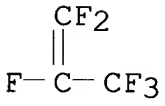


CM 2

CRN 25067-11-2
CMF (C3 F6 . C2 F4)x
CCI PMS

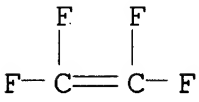
CM 3

CRN 116-15-4
CMF C3 F6



CM 4

CRN 116-14-3
CMF C2 F4



CC 23-12 (Aliphatic Compounds)
IT 677-67-8P 697-18-7P 66137-74-4P **66138-68-9P**
67990-76-5P 81439-24-9P
(preparation of)
IT **66138-68-9DP**, fluorination and dehalogenation products
(preparation of, as surfactant)

L27 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1979:492454 HCAPLUS

DOCUMENT NUMBER: 91:92454
TITLE: Improved fluorocarbon cation-exchange membrane
INVENTOR(S): Asawa, Tatsuro; Miyake, Haruhisa; Kanke, Yoshio
PATENT ASSIGNEE(S): Asahi Glass Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 54052690	A2	19790425	JP 1977-118597	1977 1004
JP 60026145	B4	19850621		

PRIORITY APPLN. INFO.: JP 1977-118597 A 1977 1004

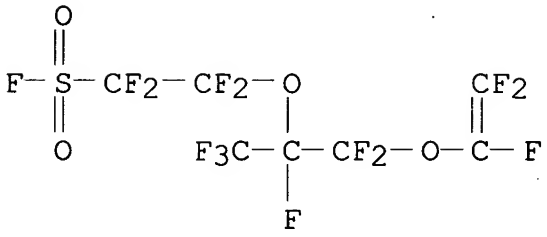
AB The title mech.-stable membranes are crosslinked copolymers of I(CF2)pO(CF2CF2O)q[CF(CF3)CF2O]rCF:CF2 (p = 2-9; q, r = 0-5), CF2:CZZ1(Z,Z1 = F, Cl, H, or CF3), and CF2:CX(CF2CFY)lOm(CFY1)nA (X = F or CF3; Y, Y1 = F or C1-10 perfluoroalkyl; A = SO3H, COOH, PO2H2, hydroxyaryl, C(CF3)2OH, or their precursors; l = 0-3; m = 0 or 1; n = 0-12); the copolymers are comprised of 0.1-10 and 1-50 mol% of the 1st and last monomers, resp. Thus, heating I(CF2)4OCF:CF2 (I) 6.3, CF2:CFOCF2CF(CF3)OCF2CF2SO2F 37.5., trichlorotrifluoromethane 31.5, and azobisisobutyronitrile 0.14 g under N in a stainless steel autoclave at 70°, and pressuring with C2F4 at 10.5 kg/cm2 for 20 h gave a copolymer containing 2.6 mol% I. The copolymer (6.2 g) was pressed at 200° to give a 200μ-thick film, heated at 250° for 6 h in vacuo to remove I and crosslink, and hydrolyzed. The 25 cm2 membrane of exchange capacity 0.79 mequiv/g was used at 85° and c.d. 20 A/dm2 to electrolyze a feed of 4N NaCl (150 mL/h) and water to give 8N NaOH with current efficiency 70%. The dimensional change of the membrane was 0.7% after 3 mo as compared with 4.5 for a membrane prepared without I.

IT **71132-02-0D**, crosslinked and hydrolyzed
(membranes, dimensionally-stable, for electrolysis of brines)
RN 71132-02-0 HCAPLUS
CN Ethanesulfonyl fluoride, 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-, polymer with 1,1,2,2,3,3,4,4-octafluoro-1-iodo-4-[(trifluoroethenyl)oxy]butane

and tetrafluoroethene (9CI) (CA INDEX NAME)

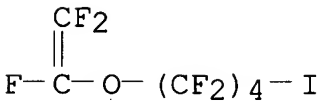
CM 1

CRN 16090-14-5
CMF C7 F14 O4 S



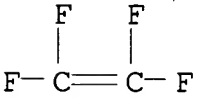
CM 2

CRN 15498-33-6
CMF C6 F11 I O



CM 3

CRN 116-14-3
CMF C2 F4



IC C08J005-22
CC 36-3 (Plastics Manufacture and Processing)
IT **71132-02-0D**, crosslinked and hydrolyzed
(membranes, dimensionally-stable, for electrolysis of brines)

L27 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1978:153252 HCAPLUS

DOCUMENT NUMBER: 88:153252
TITLE: Fluorooxaalkanesulfonic acids and their derivatives
INVENTOR(S): Caporiccio, Gerardo; Bargigia, Gianangelo; Guidetti, Giampiero
PATENT ASSIGNEE(S): Montedison S.p.A., Italy
SOURCE: Ger. Offen., 38 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 2735210	A1	19780209	DE 1977-2735210	19770804
DE 2735210	C2	19910103		
DK 7703437	A	19780207	DK 1977-3437	19770801
NO 7702722	A	19780207	NO 1977-2722	19770801
NO 145235	B	19811102		
NO 145235	C	19820210		
SE 7708780	A	19780207	SE 1977-8780	19770801
NL 7708480	A	19780208	NL 1977-8480	19770801
NL 187439	B	19910501		
NL 187439	C	19911001		
AU 7727582	A1	19790208	AU 1977-27582	19770803
AU 513700	B2	19801218		
US 4180639	A	19791225	US 1977-821394	19770803
CA 1086769	A1	19800930	CA 1977-284039	19770804
BE 857529	A1	19780206	BE 1977-179942	1977

				0805
ES 461701	A1	19780501	ES 1977-461701	
				1977
				0805
FR 2395987	A1	19790126	FR 1977-24251	
				1977
				0805
FR 2395987	B1	19841130		
GB 1566621	A	19800508	GB 1977-32834	
				1977
				0805
SU 841585	A3	19810623	SU 1977-2509910	
				1977
				0805
JP 53028120	A2	19780316	JP 1977-93764	
				1977
				0806
JP 63037096	B4	19880722		
US 4244886	A	19810113	US 1979-19005	
				1979
				0309
US 4254030	A	19810303	US 1979-19006	
				1979
				0309
SE 8300722	A	19830210	SE 1983-722	
				1983
				0210
JP 61171706	A2	19860802	JP 1986-6600	
				1986
				0117
JP 02031086	B4	19900711		
NL 9100799	A	19911101	NL 1991-799	
				1991
				0508
NL 189913	B	19930401		
NL 189913	C	19930901		
PRIORITY APPLN. INFO.:			IT 1976-26116	A
				1976
				0806
			IT 1977-20831	A
				1977
				0302
			IT 1976-20831	A
				1977
				0302

NL 1977-8480 A3
1977
0801

US 1977-821394 A3
1977
0803

AB FSO2CF2COF [677-67-8] was treated with KF to prepare FSO2CF2CF2OK which was treated with iodine and F2C:CF2 [116-14-3] to prepare FSO2CF2CF2OCF2CF2I (I) [66137-74-4]. I was used with F2C:CF2 and/or F2C:CFCF3 to prepare telomers. The telomers were treated with NaF or ClSO3H to replace iodine with F or SO3H, giving surfactants which were useful in electroplating baths or in pickling compns. for steel. The telomers were also dehydroiodinated with EtMgBr to give α-olefins (containing a terminal FSO2CF2CF2O group) which were copolymd. with F2C:CF2, F2C:CFCF3, and/or F2C:CH2, e.g. to give elastomers having good resistance to heat and chems. after vulcanization.

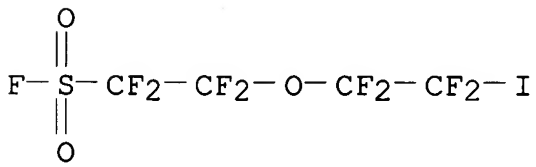
IT **66138-66-7P 66138-67-8P 66138-68-9P**
(preparation and reactions of)

RN 66138-66-7 HCAPLUS

CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-(1,1,2,2-tetrafluoro-2-iodoethoxy)-, telomer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 66137-74-4
CMF C4 F9 I O3 S

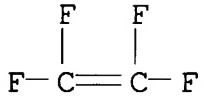


CM 2

CRN 9002-84-0
CMF (C2 F4)x
CCI PMS

CM 3

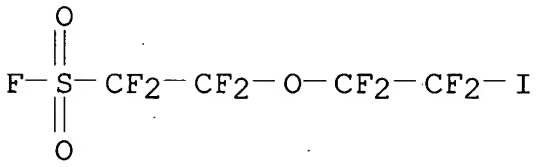
CRN 116-14-3
CMF C2 F4



RN 66138-67-8 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-(1,1,2,2-tetrafluoro-2-iodoethoxy)-, telomer with 1,1,2,3,3,3-hexafluoro-1-propene (9CI) (CA INDEX NAME)

CM 1

CRN 66137-74-4
CMF C4 F9 I O3 S

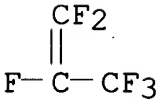


CM 2

CRN 25120-07-4
CMF (C3 F6)x
CCI PMS

CM 3

CRN 116-15-4
CMF C3 F6

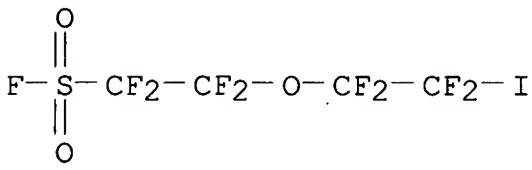


RN 66138-68-9 HCAPLUS
CN Ethanesulfonyl fluoride, 1,1,2,2-tetrafluoro-2-(1,1,2,2-tetrafluoro-2-iodoethoxy)-, telomer with 1,1,2,3,3,3-hexafluoro-1-

propene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 66137-74-4
CMF C4 F9 I O3 S

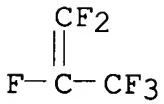


CM 2

CRN 25067-11-2
CMF (C3 F6 . C2 F4)x
CCI PMS

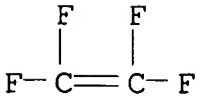
CM 3

CRN 116-15-4
CMF C3 F6



CM 4

CRN 116-14-3
CMF C2 F4



IC C07C143-70
CC 35-3 (Synthetic High Polymers)
Section cross-reference(s): 23, 46

IT 66137-74-4P **66138-66-7P 66138-67-8P**
66138-68-9P
(preparation and reactions of)